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## Significance of the behaviour of incubating tetraonid hens for population dynamics: case reports on the Black Grouse

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The populations of the Black Grouse *Tetrao tetrix* are known to fluctuate considerably from year to year in the northern part of its range (e.g. Siivonen 1957, Helminen 1963, Rajala & Lindén 1984). A number of hypotheses and theories have been presented to explain this phenomenon. Naturally, both varying natality and mortality rates may be involved. Small variation in the natality (Angelstam 1983) and great variation in the mortality (Angelstam 1985, Storaas & Wegge 1985) have been demonstrated. In principle, mortality begins at the moment when the first egg of a clutch has been laid and is exposed to the risk of a predator finding the nest. The incubating hen tends to protect her eggs against predators (Pulliainen 1971), but the flushing distance of incubating hens seems to vary. We intend to show here that when the Black Grouse population reached a peak in 1980 (Rajala & Lindén 1984), the flushing distance of the hens was remarkably short.

### Case reports:

- (1) Oulu, Sanginjoki, 22 May 1980 (observers Kauko Huhtala & A. Marjakangas)
  - (a) A nest with 10 eggs; flushing distance (FD) of hen 1 m.
  - (b) A nest with 7 eggs; FD 2 m.
  - (c) A nest with 7 eggs; the hen was flushed only when the observer walked over her.
 All three nests in a forest.
- (2) Sievi, Kukonkylä, 5 June 1980 (observers Jorma and Jari Peltokorpi, and Kauko Huhtala)
  - (a) A nest with 10 eggs on a abandoned field; the hen was flushed only when a nearby birch sapling was cut down. The flushing distance was exceptionally short later as well. All 10 eggs hatched.
  - (b) A nest with 10 eggs on a abandoned field; a very short flushing distance.
- (3) Kalajoki, in the beginning of June 1980 (observer M. Marttala)
  - (a) An incubating hen flew up below a falling tree whose top tore out some of her tail feathers. The same hen (without her tail feathers) was incubating in the same nest some days later.
- (4) Merijärvi, in the beginning of June 1980 (observer M. Marttala)
  - (a) A hen flew up at the last moment in front of a digging machine. The nest remained untouched, but its surroundings were completely altered. In spite of this, the hen was seen incubating in the nest on the following day.
- (5) Juva, Kilpola, in the beginning of June 1980 (observer Kalevi Huhtala)
  - (a) A nest with 10 eggs, FD 1 m.
  - (b) A nest with 8 eggs, FD 2 m.
  - (c) A nest with 7 eggs, FD 1 m.
  - (d) A nest with 7 eggs, FD 2 m.
  - (e) A nest with 5 eggs, FD 2 m.

## Concluding remarks:

(a) Although the clutch sizes mentioned above do not represent the complete ones in all cases, the average size ( $8.1 \pm 0.6$ ) is not far below the figure reported from this part of Finland ( $8.8 \pm 0.3$ ,  $N=33$ ; Lindén 1983).

(b) The Black Grouse nested in some slightly exceptional habitats, such as abandoned fields in the vicinity of the lek arenas.

(c) The flushing distance of the incubating hens appeared to be very short, and the birds showed high tolerance of disturbance; they did not abandon their nests, although they suffered physically, or the structure of their nesting habitat was drastically changed. This probably resulted in good nesting success; the observers also reported that they saw very few hens without young during that summer.

High tolerance of disturbance in incubating hens (and in the opposite cases, low tolerance and long flushing distances) must have some endocrine background. In laboratory investigations Wingfield (1984) has recently shown that weather may affect avian reproduction by evoking a "stress" response, resulting in elevation of the circulating levels of corticosterone and depression of reproductive hormone secretion.

**Selostus: Hautovan metsäkanalintunaaraan käyttäytymisen populaatiodinamisesta merkityksestä: esimerkkitaupauksia teerestä**

Rajalan ja Lindénin (1984) reittiarviointien mukaan maamme teerikanta oli runsaudenvaihtelussaan huipputilanteessa vuonna 1980. Tuolloin kiinnitettiin useilla tahoilla huomiota hautovien naaraiden alkaiseen pakoetäisyyteen (0–2 m). Ne sietivät jopa yrstösulkeen menettämisen pesällään ja pesän ympäristön perusteellisen mylläämisen. Vaikka kaikissa tapauksissa ei saatu selville lopullista munamäärää, pesyiden keskikoko kohosi 8.1, mikä ei ole kaukana maan keskiosan keskiarvosta (8.8; Lindén 1983). Linnut pesivät myös poikkeuksellisilla paikoilla kuten soidinpaikan läheisyydessä avoimella pakettipelloilla. Kenttähavainnot viittasivat ylipäätään hyvään pesimistulokseen tuona kesänä, mihin teerikantojen "hyvähermoisuus" varmastiikin osaltaan vaikutti. Kirjoituksen lopussa viitataan Wingfiel-

din (1984) tuoreeseen tutkimukseen, missä osoitetaan, että sääolot vaikuttavat endokriinistä tietä lintujen lisääntymiseen. Vaihtoehto nyt havaitullehan on, että kanat hylkäävät herkästi pesänsä ja jättävät ne muutoinkin predaatiolle alttiiksi.

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### General Meeting

#### of the Working Group on Granivorous Birds – INTECOL

On August 13 1986, during the IV International Congress of Ecology, Syracuse, New York, USA (10–16 August 1986) the General Meeting of the Working Group on Granivorous Birds – INTECOL, will be held.

The theme of the symposium has tentatively been formulated as "The role of granivorous birds in ecosystems". The following topics will be included: a) population dynamics, b) biomass and production rates, c) energetics, d) impact of granivorous birds on ecosystems and e) pest management.

This will include a review of up-to-date results of international studies on *Passer* and other granivorous birds and a discussion of the most fruitful directions for further study.

Oral presentations at the symposium will be limited to 15 minutes. The program of the symposium will be established by December 31 1985, based on titles and one-page abstract submitted by that date.

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